

**Amendments in the claims:**

1. (canceled)

2. (canceled)

3. (canceled)

4. (canceled)

5. (canceled)

6. (canceled)

7. (canceled)

8. (canceled)

9. (currently amended) ~~The apparatus as set forth in claim 1, wherein said nanoscale electrometer is a nanoparticle device~~ An apparatus for sequencing DNA, comprising:

(a) a nanoparticle device comprising:

~~(a)~~ (i) two electrodes; and

~~(b)~~ (ii) a nanoparticle positioned in between said two electrodes; and

(b) a protein that is capable of transcribing said DNA, wherein said protein is immobilized on said nanoparticle device to receive and transcribe said DNA.

10. (original) The apparatus as set forth in claim 9, wherein said protein is immobilized on said nanoparticle to receive said DNA.

11. (original) The apparatus as set forth in claim 9, wherein said nanoparticle is a gold nanoparticle.

12. (original) The apparatus as set forth in claim 9, wherein said nanoparticle is less than 2 nm in diameter.

13. (currently amended) The apparatus as set forth in claim 9, wherein said nanoparticle device has a sensitivity on the order of a hundredth of an electron with a 100  $\mu$ s response time.

14. (original) The apparatus as set forth in claim 9, wherein said nanoparticle is a room temperature nanoparticle.

15. (currently amended) The apparatus as set forth in claim ~~1~~ 9, wherein said protein is a RNA polymerase.

16. (currently amended) The apparatus as set forth in claim ~~1~~ 9, further comprising monitoring means attached to said ~~nanoscale electrometer~~ nanoparticle device to monitor an electronic charge configuration as said DNA moves through said protein.

17. (original) The apparatus as set forth in claim 16, further comprising computing means to compute a correlation between said electronic charge configuration and a nucleotide signature of said DNA.

18. (withdrawn) A method for sequencing DNA, comprising the steps of:

- (a) immobilizing a protein that is capable of transcribing said DNA on a nanoscale electrometer; and
- (b) delivering said DNA to said protein.

19. (withdrawn) The method as set forth in claim 18, wherein said nanoscale electrometer is a single electron transistor and said protein is immobilized on a gate of said single electron transistor.

20. (withdrawn) The apparatus as set forth in claim 19, further comprising the step of applying a voltage to charge said single electron transistor.

21. (withdrawn) The method as set forth in claim 18, wherein said nanoscale electrometer is a nanoparticle device comprising:

- (a) two electrodes; and
- (b) a nanoparticle positioned in between said two electrodes.

22. (withdrawn) The method as set forth in claim 21, wherein said protein is immobilized on said nanoparticle to receive said DNA.

23. (withdrawn) The method as set forth in claim 18, wherein said protein is a RNA polymerase.

24. (withdrawn) The method as set forth in claim 18, further comprising the step of monitoring an electronic charge configuration at said nanoscale electrometer as said DNA moves through said protein.

25. (withdrawn) The method as set forth in claim 24, further comprising the step of computing a correlation between said electronic charge and a nucleotide signature of said DNA.

26. (canceled)

27. (canceled)

28. (canceled)

29. (canceled)

30. (canceled)

31. (canceled)

32. (canceled)

33. (canceled)

34. (currently amended) ~~The integrated circuit chip as set forth in claim 26, wherein said nanoscale electrometers are nanoparticle devices, wherein each one of said nanoparticle devices comprises:~~ An integrated circuit chip for sequencing one or more DNA samples, comprising:

(a) a plurality of interconnected nanoparticle devices, each comprising:

~~(a)~~ (i) two electrodes; and

~~(b)~~ (ii) a nanoparticle positioned in between said two electrodes; and

(b) a plurality of proteins that are capable of transcribing said one or more DNA samples, wherein said proteins are immobilized on said plurality of interconnected nanoparticle devices to receive and transcribe said one or more DNA samples.

35. (original) The integrated circuit chip as set forth in claim 34, wherein for each of said nanoparticles ~~nanoparticle~~ one of said proteins is immobilized.

36. (original) The integrated circuit chip as set forth in claim 34, wherein said nanoparticle is a gold nanoparticle.

37. (original) The integrated circuit chip as set forth in claim 34, wherein said nanoparticle is less than 2 nm in diameter.

38. (currently amended) The integrated circuit chip as set forth in claim 34, wherein said nanoparticle device has a sensitivity on the order of a hundredth of an electron with a 100  $\mu$ s response time.

39. (original) The integrated circuit chip as set forth in claim 34, wherein said nanoparticle is a room temperature nanoparticle.

40. (currently amended) The integrated circuit chip as set forth in claim ~~26~~ 34, wherein said proteins are RNA polymerases.

41. (currently amended) The integrated circuit chip as set forth in claim ~~26~~ 34, further comprising monitoring means attached to said ~~nanoscale electrometers~~ nanoparticle devices to monitor electronic charge configurations as said one or more DNA samples move through said proteins.

42. (currently amended) The integrated circuit chip as set forth in claim ~~16~~ 41, further comprising computing means to compute one or more correlations between said electronic ~~charges~~ charge configurations and nucleotide signatures of said one or more DNA samples.

43. (withdrawn) A method for sequencing one or more DNA samples, comprising the steps of:

- (a) immobilizing a plurality of proteins that are capable of transcribing said DNA samples on a plurality of nanoscale electrometers; and
- (b) delivering said DNA samples to said proteins.

44. (withdrawn) The method as set forth in claim 43, wherein said nanoscale electrometers are single electron transistors and for each of said single electron transistors one of said proteins is immobilized on a gate of said single electron transistor.

45. (withdrawn) The method as set forth in claim 44, further comprising the step of applying a voltage to charge said single electron transistors.

46. (withdrawn) The method as set forth in claim 43, wherein said nanoscale electrometers are nanoparticle devices, wherein each one of said nanoparticle devices comprises:

- (a) two electrodes; and
- (b) a nanoparticle positioned in between said two electrodes.

47. (withdrawn) The method as set forth in claim 46, wherein for each of said nanoparticle one of said proteins is immobilized.

48. (withdrawn) The method as set forth in claim 43, wherein said proteins are RNA polymerases.

49. (withdrawn) The method as set forth in claim 43, further comprising the step of monitoring electronic charge configurations at said nanoscale electrometers as said DNA moves through said proteins.

50. (withdrawn) The method as set forth in claim 49, further comprising the step of computing one or more correlations between said electronic charge configurations and nucleotide signatures of said DNA.

## **DETAILED RESPONSE**

### **paragraph 1: election/restriction**

Claims 18-25 and 43-50 stand withdrawn per the election of 8/18/03.

### **paragraphs 2 and 3: rejections under 35 USC 112**

Claims 1-17 and 26-42 stand rejected under 35 USC 112 second paragraph as being indefinite for recitation of "electrometer" in claims 1 and 17. Applicant believes Examiner means claim 26 instead of claim 17 here. Also, claim 42 stands rejected under 35 USC 112 for reciting "integrated circuit" without antecedent basis.

In response, claims 1 and 26 are canceled without prejudice, and the term "electrometer" does not appear in any claim currently presented. Claim 42 is amended to depend from claim 41, which depends from claim 34 which recites "integrated circuit".

### **paragraphs 4 and 5: rejections under 35 USC 103(a)**

Claims 1-3, 16, 17, 26-28, 41, and 42 stand rejected under 35 USC 103(a) over US 5,827,482 (hereinafter Shieh) in view of US 5,959,095 (hereinafter Martinelli).

In response, claims 1-3 and 26-28 are canceled without prejudice. Claims 16 and 17 are amended to depend from allowable claim 9. Claims 41 and 42 are amended to depend



from allowable claim 34. Thus Applicant regards claims 16, 17, 41, and 42 as allowable.

**paragraph 6: rejections under 35 USC 103(a)**

Claims 4-8, and 29-33 stand rejected under 35 USC 103(a) over Shieh in view of Martinelli in further view of US 5,731,598 (hereinafter Kado).

In response, claims 4-8 and 29-33 are canceled without prejudice.

**paragraph 7: allowable subject matter**

Claims 9-15 and 34-40 are indicated as allowable if rewritten to overcome the rejections under 35 USC 112.

Applicant appreciates Examiner's indication of allowable subject matter.

In response, claims 9 and 34 are currently amended to be in independent form, and to include all limitations in claims from which they depend. Furthermore, the term "electrometer" is not used in claims 9 and 34, thus removing the basis for the 112 rejection applied to these claims.

Claims 10-15 depend from claim 9, and claims 35-40 depend from claim 34. Thus the above amendments to claims 9 and 34 are believed to render claims 10-15 and 35-40 allowable.